

What is claimed is:

1. A paint composition, comprising:
 - a layer organic-inorganic composite; and
 - titanium alkoxide in an amount of from 1 to 50 parts by weight with respect to the layer organic-inorganic composite taken as 100 parts by weight;
 - the layer organic-inorganic composite composed of a laminated substance comprising:
 - a tetrahedral structural layer made of tetrahedral structures whose central atom M' is Si or a first metallic atom substituting for a part the Si, at least a part of the central atom M' covalent-bonded to an organic group R involving or free from a polymerizable functional group; and
 - an octahedral structural layer made of octahedral structures whose central atom M is a second metallic atom; and
 - the layer organic-inorganic composite expressed by a general formula, $\{R_nM'O_{(4-n)/2}\}_x(MO_{z/2}) (H_2O)_w$, wherein n is an integer of from 1 to 3, x is from 0.5 to 2.0, z is the valence number of the central atom M and is an integer of from 2 to 4, and w is the number of crystal water molecules and is an integer falling in a range of from $\{(z/2)-1\}$ to $(z+1)/2$.
2. The paint composition set forth in claim 1, wherein the first metallic atom substituting for a part of the Si and making the central atom M' is at least one atom selected from the group consisting of Al, Fe, P and Ti.

3. The paint composition set forth in claim 1, wherein the central atom M is at least one atom selected from the group consisting of Mg, Al, Ni, Co, Cu, Mn, Fe, Li, V, Zr and Ti.

4. The paint composition set forth in claim 1 further comprising at least one member selected from the group consisting of organic solvents and curing catalysts.

5. The paint composition set forth in claim 1 further comprising an alkoxy silane compound.

6. The paint composition set forth in claim 4 comprising an organic solvent in an amount of from double to 10 times of the weight of the layer organic-inorganic composite.

7. A process for producing a wear-resistant coating film, comprising the steps of:

preparing a paint composition comprising:

a layer organic-inorganic composite; and
titanium alkoxide in an amount of from 1 to 50 parts by weight with respect to the layer organic-inorganic composite taken as 100 parts by weight;

the layer organic-inorganic composite composed of a laminated substance comprising:

a tetrahedral structural layer made of tetrahedral structures whose central atom M' is Si or a first metallic atom substituting for a part the Si, at least a part of the central atom M' covalent-bonded to an organic group R involving

or free from a polymerizable functional group; and

an octahedral structural layer made of octahedral structures whose central atom M is a second metallic atom; and

the layer organic-inorganic composite expressed by a general formula, $\{R_nM'O_{(4-n)/2}\}_x(MO_{z/2}) (H_2O)_w$, wherein n is an integer of from 1 to 3, x is from 0.5 to 2.0, z is the valence number of the central atom M and is an integer of from 2 to 4, and w is the number of crystal water molecules and is an integer falling in a range of from $\{(z/2)-1\}$ to $(z+1)/2$;

coating the paint composition on a surface of a resinous substrate; and

forming a wear-resistant coating film by giving a physical stimulus to the paint composition to cause the paint composition to react and cure.

8. The process set forth in claim 7, wherein the first metallic atom substituting for a part of the Si and making the central atom M' is at least one atom selected from the group consisting of Al, Fe, P and Ti.

9. The process set forth in claim 7, wherein the central atom M is at least one atom selected from the group consisting of Mg, Al, Ni, Co, Cu, Mn, Fe, Li, V, Zr and Ti.

10. The process set forth in claim 7, wherein the paint composition further comprises at least one member selected from the group consisting of organic solvents and curing catalysts.

11. The process set forth in claim 7, wherein the paint composition further comprises an alkoxy silane compound.

12. The process set forth in claim 7, wherein the resinous substrate is composed of polycarbonate.

13. The process set forth in claim 7, wherein the physical stimulus is at least one stimulus selected from the group consisting of heating and emitting ultraviolet rays.

14. A wear-resistant coating film, comprising:
a paint composition coated on a surface of a resinous substrate,
and comprising:

 a layer organic-inorganic composite; and
 titanium alkoxide in an amount of from 1 to 50 parts
 by weight with respect to the layer organic-inorganic composite
 taken as 100 parts by weight;

 the layer organic-inorganic composite composed of a
 laminated substance comprising:

 a tetrahedral structural layer made of
 tetrahedral structures whose central atom M' is Si or a first
 metallic atom substituting for a part the Si, at least a part of
 the central atom M' covalent-bonded to an organic group R involving
 or free from a polymerizable functional group; and

 an octahedral structural layer made of octahedral
 structures whose central atom M is a second metallic atom; and

 the layer organic-inorganic composite expressed by a
 general formula, $\{R_nM'_{(4-n)/2}O_{(4-n)/2}\}_x(MO_{2/2})_{(H_2O)_w}$, wherein n is an integer

of from 1 to 3, x is from 0.5 to 2.0, z is the valence number of the central atom M and is an integer of from 2 to 4, and w is the number of crystal water molecules and is an integer falling in a range of from $\{(z/2)-1\}$ to $(z+1)/2$; and

the wear-resistant coating film further comprising:

organic cross-links formed by polymerization of the polymerizable functional groups of the layer organic-inorganic composite and the polymerizable functional groups of the other layer organic-inorganic composites neighboring the layer organic-inorganic composite, the polymerization induced by a physical stimulus given to the paint composition; and

inorganic cross-links formed by a reaction between the titanium alkoxide, reacted with and bonded to end hydroxide groups of at least one of the tetrahedral structures and octahedral structures of the layer organic-inorganic composite, and the other titanium alkoxides, reacted with and bonded to end hydroxide groups of at least one of the tetrahedral structures and octahedral structures of the other layer organic-inorganic composites neighboring the layer organic-inorganic composite, the reaction induced by the physical stimulus given to the paint composition.

15. The wear-resistant paint film set forth in claim 14, wherein the first metallic atom substituting for a part of the Si and making the central atom M' is at least one atom selected from the group consisting of Al, Fe, P and Ti.

16. The wear-resistant paint film set forth in claim 14, wherein the central atom M is at least one atom selected from the group

consisting of Mg, Al, Ni, Co, Cu, Mn, Fe, Li, V, Zr and Ti.

17. The wear-resistant paint film set forth in claim 14, wherein the paint composition further comprises at least one member selected from the group consisting of organic solvents and curing catalysts.

18. The wear-resistant paint film set forth in claim 14, wherein the paint composition further comprises an alkoxy silane compound.

19. The wear-resistant paint film set forth in claim 14, wherein the resinous substrate is composed of polycarbonate.

20. The wear-resistant paint film set forth in claim 14, wherein the physical stimulus is at least one stimulus selected from the group consisting of heating and emitting ultraviolet rays.